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1. ARTICLE: Simply Irresistible: Neuromarketing and the Commercial Speech Doctrine, 50 Duq. L. Rev. 605
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ARTICLE: Simply Irresistible: Neuromarketing and the Commercial Speech Doctrine

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Reporter: 50 Duq. L. Rev. 605**Length:** 16920 words**Author:** Marisa E. Main ***LexisNexis Summary**

... The rationale underlying this prong of the Central Hudson test is that government regulation of misleading commercial speech is necessary to preserve a fair bargaining process between the advertiser and the consumer. ... If courts were presented today with empirical data that advertising does, in fact, affect consumer behavior and further research showing the potential uses of neuromarketing, this first prong of the Central Hudson analysis may be revised or interpreted differently, in order to allow more government regulation of commercial speech. ... If researchers are able to accomplish the types of results currently being predicted, a complete ban on neuromarketing-produced commercial speech would be directly related to preventing the very real harm that the advertisements may persuade consumers on a subconscious level to purchase products that rationally, they may neither need nor want. ... Government-Required Warnings on Neuromarketing as Compelled Commercial Speech The government could attempt to regulate neuromarketing by requiring companies to include warning labels on any neuroscience-produced advertisements, explaining to consumers that these advertisements have been created with neuromarketing research. ... Further, the regulation would not be overly excessive, because requiring the commercial speech to include more information is less extensive than banning the speech completely; especially taking into account that the rationale for granting First Amendment protection to commercial speech includes providing consumers with truthful information to help them make informed purchasing decisions.

Text**[*605] I. INTRODUCTION**

Recent developments in neuroscience allow marketing researchers to watch our brains react to advertisements and observe not only our conscious thought process in response to an advertise-

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ment, but also how our subconscious processes an advertisement.¹ With this window into our minds, neuromarketing research allows companies to tailor advertisements to elicit reactions we may not [*606] even be aware of, and in turn, manipulate our decision-making processes.² While this may sound like something out of a science fiction film, it may be much closer to reality than almost anyone is aware.

The use of neuroscience in advertising raises the legal issue of whether the government can and should be able to regulate it under the commercial speech doctrine. Using neuromarketing to manipulate consumers is in opposition to every justification or policy reason for granting First Amendment protection to commercial speech, and for protecting the freedom of speech in general. The manipulation of consumers through neuromarketing does not promote informed decision-making by consumers or assist in discovering the truth.

In this article, I analyze the current state of the commercial speech doctrine and the constitutionality of potential government regulations of neuromarketing. I discuss the potential constitutionality of a complete ban of neuromarketing. I also consider the constitutionality of a regulation requiring advertisers to include a warning that alerts consumers when advertisements have been created using neuromarketing techniques. Last, I review an application of the commercial speech doctrine to a potential government regulation of neuromarketing that promotes harmful products, considering a revival of the "greater-power-includes-the-lesser-power" principle in this context.

II. THE COMMERCIAL SPEECH DOCTRINE

The First Amendment to the United States Constitution provides that "Congress shall make no law . . . abridging the freedom of speech, or of the press" ³ Today, the four-part test laid out by the United States Supreme Court in *Central Hudson Gas & Electric Corp. v. Public Service Commission of New York* governs the constitutionality of any government regulation of commercial speech.⁴ This test was only fairly recently formulated and adopted by the Court, because historically, commercial speech did not receive First Amendment protection. In *Valentine v. Chrestensen*, in 1942, the United States Supreme Court stated, "the Constitution imposes no . . . restraint on government as respects purely commercial advertising,"⁵ in sustaining a New York City ban on advertisements in the street.⁶

It was not until 1976 that the Court afforded commercial speech any protection under the First Amendment, with its decision in *Virginia State Board of Pharmacy v. Virginia Citizens Consumer Council, Inc.*⁷ In holding void a statute that prohibited pharmacists from advertising prescription drug prices, the Court concluded:

¹ See *infra* note 56 and accompanying text.

² See *infra* notes 102, 109 and accompanying text.

³ U.S. CONST. amend. I.

⁴ [447 U.S. 557\(1980\).](#)

⁵ [316 U.S. 52, 54 \(1942\).](#)

⁶ *Id.* at 55. The regulation seems almost laughable today, as it sought to prevent the distribution of "any handbill, circular, card, booklet, placard or other advertising matter whatsoever" in New York City. *Id.* at 53 n.1. Yet, the Court stated that the city was entitled to prohibit the pursuit of business and advertisement in the streets if it deemed it an "undesirable invasion of, or interference with, the full and free use of the highways by the people in fulfillment of the public use to which streets are dedicated." *Id.* at 54-55. One can only imagine how the city and Court of that era would react to the Times Square of today.

⁷ [425 U.S. 748 \(1976\).](#)

Our question is whether speech which does no more than propose a commercial transaction, is so removed from any exposition of ideas, and from truth, science, morality, and arts in general, in its diffusion of liberal sentiments on the administration of Government, that it lacks all protection. Our answer is that it is not.⁸

The Court gave brief justifications for providing First Amendment protection to commercial speech. First, the Court stated that the information pharmacists would provide to customers about drug prices is valuable to them and that in regard to drug prices, a consumer's "interest may be as keen, if not keener by far, than his interest in the day's most urgent political debate."

The second justification provided by the Court was that there was First Amendment value in commercial speech, because society [*608] has a strong interest in the free flow of commercial information.¹¹ The Court stated, "[s]o long as we preserve a predominately free enterprise economy, the allocation of our resources in large measure will be made through numerous private economic decisions. It is a matter of public interest that those decisions, in the aggregate, be intelligent and well informed."¹² The Court then reasoned that the free flow of commercial information is "indispensable to the proper allocation of resources in a free enterprise," and therefore, also "indispensable to the formation of intelligent opinions as to how that system ought to be regulated or altered."¹³

However, the Court did not afford commercial speech full First Amendment protection.¹⁴ Instead, the Court stated that there exists "commonsense differences between speech that does no more than propose a commercial transaction and other varieties" that might not "justify the conclusion that commercial speech is valueless, and thus subject to complete suppression by the State, . . . [but] nonetheless suggest that a different degree of protection is necessary to insure that the flow of truthful and legitimate commercial information is unimpaired."¹⁵ The Court distinguished commercial speech from other types of speech, singling it out for lesser protection, on two bases.¹⁶ First, "the truth of commercial speech may be more easily verifiable by its disseminator . . . in that ordinarily, the advertiser seeks to disseminate information about a specific product or service that he himself provides and presumably knows more about than anyone else."¹⁷ Second, the Court considered commercial speech to be "more durable than other kinds," being the "[s]ine qua non of commercial profits," such that "there is little likelihood of its being chilled by proper regulation and forgone entirely."¹⁸

The Court listed several limitations on the First Amendment protection it had granted to commercial speech, which included: no protection for advertisements for illegal transactions; no protection for factually false or misleading advertisements; and that commercial speech may be subject to

⁸ Va. State Bd. of Pharmacy, 425 U.S. at 762 (citations omitted) (internal quotation marks omitted).

¹¹ Id. at 764.

¹² Id. at 765.

¹³ Id.

¹⁴ Id. at 772 n.24 (internal citations omitted).

¹⁵ Va. State Bd. of Pharmacy, 425 U.S. at 772 n.24 (internal citations omitted).

¹⁶ Id.

¹⁷ Id.

¹⁸ Id.

prior restraints.¹⁹ Ultimately, with this decision, the Court anointed commercial speech with the protection of the First Amendment, but to a lesser degree. That level of protection was fleshed out four years later in *Central Hudson v. Public Service Commission of New York*.²⁰

In *Central Hudson*, the Supreme Court adopted a four-part analysis for determining the constitutionality of regulations of commercial speech.²¹ The facts of *Central Hudson* involved the Public Service Commission enacting a ban on promotional advertising designed to stimulate demand for electricity.²² The Public Service Commission hoped to prevent an increased demand for electricity because of recent severe fuel shortages.²³ In holding that the ban was invalid, the Court applied a four-part analysis for regulations of commercial speech:

At the outset we must determine whether the expression is protected by the First Amendment. For commercial speech to come within that provision, it at least must concern lawful activity and not be misleading. Next, we must ask whether the asserted governmental interest is substantial. If both inquiries yield positive answers, we must determine whether the regulation directly advances the governmental interest asserted, and whether it is not more extensive than is necessary to serve that interest.²⁴

The Court again noted that because of “the ‘commonsense’ distinction between speech proposing a commercial transaction, which occurs in an area traditionally subject to government regulation, and other varieties of speech,” the Constitution “accords a lesser protection to commercial speech.” The Court’s asserted reason for providing any protection to commercial speech was that it serves the economic interest of the speaker and consumer, furthering “the societal interest in the fullest possible dissemination of information.”

Central Hudson was not a unanimous decision though, and in a lengthy dissent, Justice Rehnquist warned that the decision “fail [ed] to give due deference to this subordinate position of commercial speech,” returning to the “bygone era of *Lochner v. New York*, in which it was common practice for this Court to strike down economic regulations adopted by a State”²⁷ Rehnquist asserted that “[he] thought by now it had become well established that a State had broad discretion in imposing economic regulations.”²⁸ Rehnquist argued against the Court’s rationale for affording protection to commercial speech, stating that “[t]he notion that more speech is the remedy to expose falsehood and fallacies is wholly out of place in the commercial bazaar, where if applied logically the remedy of one who was defrauded would be merely a statement, available upon request, reciting the Latin maxim ‘[caveat emptor].’”²⁹ He continued by stating that “in a democracy, the economic is subordinate to the political, a lesson that our ancestors learned long

¹⁹ *Id.*

²⁰ [447 U.S. 557 \(1980\)](#).

²¹ *Id.* at 566.

²² *Id.* at 559-60.

²³ *Id.* at 559.

²⁴ *Id.* at 566.

²⁷ *Id.* at 589 (Rehnquist, J., dissenting). In *Lochner v. New York*, the Supreme Court held that a New York statute setting a limit on the number of hours bakery employees could work each week was unconstitutional. [198 U.S. 45, 64 \(1905\)](#).

²⁸ *Cent. Hudson*, 447 U.S. at 589 (Rehnquist, J., dissenting).

²⁹ *Id.* at 598. “Caveat Emptor” translates to “let the buyer beware.” BLACK’S LAW DICTIONARY 252 (9th ed. 2009).

ago, and that our descendants will undoubtedly have to relearn many years hence.”³⁰

Though the majority were unmoved by Justice Rehnquist’s argument in *Central Hudson*, he succeeded, in 1986, in persuading the Court to remit some of the protections afforded commercial speech in the case of *Posadas de Puerto Rico Associates v. Tourism Company of Puerto Rico*.³¹ In *Posadas*, the Court sustained a regulation restricting advertising of casino gambling, enacted in order to reduce demand for gambling, because of a concern for public health, safety, and welfare.³² The Court focused on prongs three and four of the *Central Hudson* test, finding that the legislature’s conclusion that advertising bans would reduce resident gambling was “reasonable.”³³ The Court reasoned that because Puerto Rico had the greater power to completely ban casino gambling, it necessarily had the lesser power to ban advertising of casino gambling.³⁴ Delivering the opinion of the Court, Rehnquist noted that “it is precisely *because* the government could have enacted a wholesale prohibition of the underlying conduct that it is permissible for the government to take the less intrusive step of allowing the conduct, but reducing the demand through restrictions on advertising.”³⁵ Thus, the Court seemed to adopt a vice exception to the protection of commercial speech. This vice exception was reiterated in 1993, in *United States v. Edge Broadcasting Co.*,³⁶ before being eventually denounced in 1996, in *44 Liquormart, Inc. v. Rhode Island*.³⁷

In *Edge Broadcasting*, the Supreme Court upheld a statute prohibiting the radio broadcast of lottery advertising by licensees located in non-lottery states.³⁸ The Court stated that “the activity underlying the relevant advertising--gambling--implicates no constitutionally protected right; rather, it falls into a category of ‘vice’ activity that could be, and frequently has been, banned altogether.”³⁹ As in *Posadas*, the Court held that it was reasonable for Congress to find a connection between advertising and demand, and choose to advance its policy of decreasing demand for

³⁰ Cent. Hudson, 447 U.S. at 599 (Rehnquist, J., dissenting).

³¹ [478 U.S. 328\(1986\)](#).

³² Posadas, 478 U.S. at 341.

³³ Id. at 342. *Central Hudson* Id. at 341.

[I]s not necessarily perfect, but reasonable; that represents not necessarily the single best disposition but one whose scope is in proportion to the interest served; that employs not necessarily the least restrictive means but, as we have put it in the other contexts . . . a means narrowly tailored to achieve the desired objective.

[United States v. Am. Library Ass’n, Inc., 539 U.S. 194, 218 \(2003\)](#) (quoting [Bd. of Trs. of State Univ. of N.Y. v. Fox, 492 U.S. 469, 480 \(1989\)](#)). See also [Rubin v. Coors Brewing Co., 514 U.S. 476, 486 \(1995\)](#).

³⁴ Posadas, 478 U.S. at 345-46.

³⁵ Id. at 346.

³⁶ [509 U.S. 418 \(1993\)](#).

³⁷ [517 U.S. 484 \(1996\)](#). There is still an exception for advertisements of activity that is actually illegal. The Court has stated that such an exception exists consistently, without much explanation. CHEMERINSKY, *supra* note 9, § 11.3.7.4. The only Supreme Court case considering an advertisement of illegality is [Pittsburgh Press Co. v. Pittsburgh Comm’n on Human Relations, 413 U.S. 376 \(1973\)](#). The Court found help-wanted advertisements listed in columns that were titled “Jobs-Male Interest,” “Jobs-Female Interest,” and “Male-Female,” were unconstitutional, holding that “[d]iscrimination in employment is not only commercial activity, it is illegal commercial activity under the Ordinance. We have no doubt that a newspaper constitutionally could be forbidden to publish a want ad proposing a sale of narcotics or soliciting prostitutes The illegality in this case may be less overt, but we see no difference in principle here.” Pittsburgh Press, 413 U.S. at 388. Thus, the cases seemingly turn on whether or not the underlying harmful conduct is in fact made illegal by government regulation.

³⁸ 509 U.S. at 436.

³⁹ Id. at 426.

gambling through the regulation of advertising for it.⁴⁰

However, in *44 Liquormart*, the Court unanimously held unconstitutional a Rhode Island statute prohibiting the advertisement of liquor prices.⁴¹ In a portion of the plurality opinion joined by three justices, Justice Stevens called the Court's previous *Posadas* decision "erroneous." Stevens reasoned that "the 'greater-includes-the-lessor' argument should be rejected for the additional and more important reason that it is inconsistent with both logic and well-settled doctrine."⁴² Citing a fishing proverb, Stevens stated that it is "quite clear that banning speech may sometimes prove far more intrusive than banning conduct."⁴³ Stevens concluded that the power to ban activity is not necessarily "greater" than the power to suppress speech about it.⁴⁴ Stevens relied on the text of the First Amendment, which he argued presumes that attempted regulation of speech is more dangerous than attempted regulation of conduct, and that this notion is in accordance with "the essential role that the free flow of information plays in a democratic society."⁴⁵ In a separate opinion, Justice Thomas wrote that "[i]n cases such as this, in which the government interest is to keep legal users of a product or service ignorant in order to manipulate their choices in the marketplace . . . such an 'interest' is *per se* illegitimate."⁴⁶ Therefore, a majority of the Court overturned any vice exception in the commercial speech doctrine.

In a more recent, 2002 decision, *Thompson v. Western States Medical Center*, the Supreme Court reiterated its rationale for affording First Amendment protection to commercial speech and recognized the continuing vitality of the *Central Hudson* four-part analysis, despite several members of the Court having expressed doubt as to its applicability in particular cases.⁴⁷ The rationale put forth for the continued protection of commercial speech involved the "public interest that economic decisions . . . be intelligent and well-informed," a "particular consumer's interest in the free flow of commercial information," and that "the commercial marketplace . . . provides a forum where ideas and information flourish."⁴⁸ The case involved a provision of the Food and Drug

⁴⁰ Id. at 434. The Court also reasoned that advertisement of the activity was not required to be banned in its entirety, but that lesser forms of regulation were legitimate, stating "[n]or do we require that the Government make progress on every front before it can make progress on any front." *Id.*

⁴¹ 517 U.S. at 516.

⁴² Id. at 511.

⁴³ *Id.* The proverb cited was "give a man a fish, and you feed him for a day. Teach a man to fish, and you feed him for a lifetime." *Id.*

⁴⁴ *Id.*

⁴⁵ Id. at 512.

⁴⁶ *44 Liquormart*, 517 U.S. at 518 (Thomas, J., concurring in part and concurring in judgment).

⁴⁷ [535 U.S. 357, 366-68 \(2002\)](#). The Court cites several cases as examples of justices questioning the *Central Hudson* analysis, including [Greater New Orleans Broad. Ass'n, Inc. v. United States](#), 527 U.S. 173, 197 (1999) (Thomas, J., concurring in judgment) ("I continue to adhere to my view that in cases such as this, in which the government's asserted interest is to keep legal users of a product or service ignorant in order to manipulate their choices in the marketplace, the *Central Hudson* test should not be applied because such an interest is *per se* illegitimate and can no more justify regulation of commercial speech than it can justify regulation of noncommercial speech." (internal quotations omitted)); *44 Liquormart*, 517 U.S. at 500 n.10, 501, 510-14 (opinion of Stevens, J., joined by Kennedy & Ginsburg, JJ.) (discussing the holding of *Central Hudson* and noting that the concurring Justices "expressed doubt whether suppression of information concerning the availability and price of a legally offered product is ever a permissible way for the State to 'dampen' the demand for or use of the product"); *id.* at 517 (Scalia, J., concurring in part and concurring in judgment) ("I share Justice Thomas's discomfort with the *Central Hudson* test, which seems to me to have nothing more than policy intuition to support it."); *id.* at 518 (Thomas, J., concurring in part and concurring in judgment) (arguing that where "the government's asserted interest is to keep legal users of a product or service ignorant in order to manipulate their choices in the marketplace," the test adopted in *Central Hudson* "should not be applied").

⁴⁸ *Thompson*, 535 U.S. at 366-67.

Administration Modernization Act of 1997,⁴⁹ which sought to prevent the makers of “compound drugs” from advertising or promoting the drugs.⁵⁰ The Court struck down the provision as unconstitutional, applying the *Central Hudson* analysis and focusing primarily on the fourth prong of the analysis, which requires that the speech restrictions not be more restrictive than necessary.

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However, a dissent joined by then-Chief Justice Rehnquist argued that it was reasonable to believe that the speech restrictions directly advanced the Government’s interest in protecting the health and safety of the American public and that Congress could not have achieved its safety objectives in significantly less restrictive ways.⁵² Further, as support for upholding the provision, the dissent argued that the special risks posed by compound drugs created a danger and that there “is considerable evidence that consumer oriented advertising will create strong consumer-driven demand for a particular drug.”⁵³

Despite the fact that the commercial speech doctrine has been unsettled over the years,⁵⁴ it appears that commercial speech currently retains its limited protection under the First Amendment, and the *Central Hudson* four-part analysis continues to govern.⁵⁵

⁴⁹ [21 U.S.C. § 353a](#) (1998).

⁵⁰ Thompson, 535 U.S. at 364-65.

Drug compounding is a process by which a pharmacist or doctor combines, mixes, or alters ingredients to create a medication tailored to the needs of an individual patient. Compounding is typically used to prepare medications that are not commercially available, such as medication for a patient who is allergic to an ingredient in a mass-produced product.

Id. at 360-61.

⁵¹ *Id.* at 371-74.

⁵² *Id.* at 379, 387-88 (Breyer, J., dissenting, joined by Rehnquist, C.J., Stevens & Ginsburg, JJ.).

⁵³ *Id.* at 383 (citing NAT’L INST. FOR HEALTH CARE MGMT., FACTORS AFFECTING THE GROWTH OF PRESCRIPTION DRUG EXPENDITURES iii (July 9, 1999) (three antihistamine manufacturers spent \$ 313 million on advertising in 1998 and accounted for ninety percent of the prescription drug antihistamine market)); Francesca Kritz, *Ask Your Doctor About . . . Which of the Many Advertised Allergy Drugs Are Right for You?*, WASH. POST, June 6, 2000, at Z9 (noting that the manufacturer of the world’s top selling allergy drug, the eighth best-selling drug in the United States, spent almost \$ 140 million in 1999 on advertising); 1999 PREVENTION MAG. 10 (spending on direct-to-consumer advertising of prescription medicine increased from \$ 965.2 million in 1997 to \$ 1.33 billion in 1998)).

⁵⁴ See *A New Architecture of Commercial Speech Law* 31 HARV. J.L. & PUB. POL’Y 663, 665 (2008); *Against Freedom of Commercial Expression* 29 CARDOZO L. REV. 2583, 2589-90 (2008); *See What is Commercial Speech? The Issue Not Decided in* 54 CASE W. RES. L. REV. 1143 (2004); *Hunt v. City of L.A.*, 638 F.3d 703, 715 (9th Cir. 2011); *United States v. United Foods, Inc.*, 533 U.S. 405, 409 (2001); *Bd. of Trs. of State Univ. of N.Y. v. Fox*, 492 U.S. 469, 473-74 (1989)).

Although the Supreme Court has also defined commercial speech as “expression related solely to the economic interests of the speaker and its audience,” *Cent. Hudson*, 447 U.S. at 561, 100 S.Ct. 2343, cases decided after *Central Hudson* have relied on the “proposal of a commercial transaction” test. See *City of Cincinnati v. Discovery Network, Inc.*, 507 U.S. 410, 113 S.Ct. 1505, 123 L.Ed.2d 99 (1993) (recognizing the definition in *Central Hudson*, but acknowledging that neither *Bolger* nor *Fox* used this definition); see also *Coyote Publ’n, Inc. v. Miller*, 598 F.3d 592, 298 (9th Cir.2010); *White v. City of Sparks*, 500 F.3d 953, 957 (9th Cir.2007).

Id. at 715 n.6.

⁵⁵ See, e.g., *Sorrell v. IMS Health Inc.*, 131 S. Ct. 2653, 2667-68 (2011) (applying the *Central Hudson* factors to an inquiry into the constitutionality of a regulation burdening commercial speech); *Hunt v. City of L.A.*, 638 F.3d 703, 715 (9th Cir. 2011) (“But where only commercial speech is at issue, the time, place, and manner framework does not apply and courts apply the framework articulated in [*Central Hudson*].”); *Int’l Dairy Food Ass’n v. Boggs*, 622 F.3d 628, 636 (6th Cir. 2010) (“Prophylactic bans on commercial speech are evaluated under a four-part analysis first set forth in [*Central Hudson*].”); *Educ. Media Co. at Va. Tech., Inc. v. Swecker*, 602 F.3d 583, 588 (4th Cir. 2010) (“Both parties agree that to determine whether a regulatory burden on commercial speech violates the First Amendment, we apply the four-part test set forth in [*Central Hudson*].”); *Alexander v. Cahill*, 598 F.3d 79, 88 (2nd Cir. 2010) (stating that “[t]he Supreme Court has established a four-part inquiry for determining whether regu-

[*615] III. NEUROMARKETING

The use of neuroscience in marketing is considered to have begun in 1999, when Gary Zaltman, an emeritus professor of business administration at the Harvard Business School, began using functional magnetic resonance imaging ("fMRI") in marketing studies to examine how the brain processes and reacts to advertisements.⁵⁶ The term "neuromarketing" was not coined until 2002 by Ale Smidts, director for the Center for Neuroeconomics at Erasmus University in Rotterdam in the Netherlands.⁵⁷ While neuromarketing is in its early stages, researchers have been looking to science for help in improving marketing strategies for centuries.

Several different methods for making advertising more effective or studying the effectiveness of advertising have evolved over time. Most commonly heard of, subliminal advertising is a historical method purportedly used by advertisers to market to the subconscious minds of consumers.⁵⁸ E.W. Scripture published his study of a technique he coined "subliminal messaging" in 1898, which involved flashing an image or set of words so quickly that the conscious mind could not register them, but the subconscious [*616] could.⁵⁹ In 1957, James Vicary claimed he had tapped into the power of subliminal messaging with his infamous movie screening experiment, where he claimed that rapidly flashing "Drink Coca-Cola" and "Eat Popcorn" during the movie made people buy significantly more popcorn and other snacks.⁶⁰ The study caused a public controversy for years, leading to the banning of subliminal advertising in Australia, Britain, and the

lations of commercial speech are consistent with the First Amendment" and discussing the *Central Hudson* test); [Byrum v. Landreth](#), 566 F.3d 442, 445-46 (5th Cir. 2009) ("Regulations of commercial speech must comply with the *Central Hudson* test."); [SKF USA, Inc. v. U.S. Customs & Border Protection](#), 556 F.3d 1337, 1355 (Fed. Cir. 2009) (applying the "[w]ell established *Central Hudson* test" because the circumstances of the case were very similar to that of commercial speech); [Passions Video, Inc. v. Nixon](#), 458 F.3d 837, 841 (8th Cir. 2006) ("The Missouri statute regulates outdoor advertising, therefore we must apply the four-step commercial speech analysis outlined by the Supreme Court in *Central Hudson* to determine whether the statute is constitutionally sound."); [Nat'l Coalition of Prayer, Inc. v. Carter](#), 455 F.3d 783, 793 (7th Cir. 2006) ("[T]he Court issued the seminal *Central Hudson* decision, which established the current governing test for First Amendment challenges to commercial speech."); [This That and the Other Gift and Tobacco, Inc. v. Cobb Cnty.](#), 439 F.3d 1275, 1278 (11th Cir. 2006) ("Courts use the four-prong test in *Central Hudson* to determine if commercial speech is protected by the First Amendment."); [Pitt News v. Pappert](#), 379 F.3d 96, 106 (3rd Cir. 2004) (stating that the regulation at issue "must satisfy the test for restrictions on commercial speech set out in *Central Hudson*"); [Mainstream Marketing Servs., Inc. v. F.T.C.](#), 358 F.3d 1228, 1236 (10th Cir. 2004) ("In reviewing commercial speech regulations, we apply the *Central Hudson* test."); [Consol. Cigar Corp. v. Reilly](#), 218 F.3d 30, 41-42 (1st Cir. 2000) (stating that "[i]n *Central Hudson*," the Supreme Court summarized the four-part analysis used to determine the constitutionality of government restrictions on commercial speech" and applying the test), *aff'd in part, rev'd on other grounds* [Lorillard Tobacco Co. v. Reilly](#), 533 U.S. 525 (2001); [Pearson v. Shalala](#), 164 F.3d 650, 655-56 (D.C. Cir. 1999) (applying the *Central Hudson* test).

⁵⁶ ZACK LYNCH & BYRON LAURSEN, *THE NEURO REVOLUTION: HOW BRAIN SCIENCE IS CHANGING OUR WORLD* 50 (1st ed. 2009). Gary Zaltman more recently published a book on researching the thought processes of consumers. See GARY ZALTMAN, *HOW CUSTOMERS THINK: ESSENTIAL INSIGHTS INTO THE MIND OF THE MARKET* (2003); Manda Mahoney, *The Subconscious Mind of the Consumer (and How to Reach It)*, HARVARD BUS. SCH. (Jan. 13, 2003), <http://hbswk.hbs.edu/item/3246.html>. Gary Zaltman is apparently currently working on a method called "Zmet" which stands for Zaltman Metaphor Elicitation Technology, which is a patented technology that attempts to detect unconscious thoughts with pictures. Donna Mitchell-Magaldi, *Head Games: Neuromarketing Applies to the Power of MRI to Study Our Reaction to Ads*, NERAC (Mar. 26, 2007), http://nerac.com/nerac_insights.php?category=articles&id=200.

⁵⁷ LYNCH & LAURSEN, *supra* note 56, at 50.

⁵⁸ Stephen Ornes, *Whatever Happened to ... Subliminal Advertising?*, DISCOVER MAG., Feb. 2008, at 12, 12.

⁵⁹ LYNCH & LAURSEN, *supra* note 56, at 51.

⁶⁰ Johan C. Karremans et al., *Beyond Vicary's Fantasies: The Impact of Subliminal Priming and Brand Choice*, 42 J. EXPERIMENTAL SOC. PSYCHOL. 792, 792 (2005). Despite the fact that Vicary lied about his results, the notion that subliminal advertising can influence individuals continues to persuade consumers, as Americans apparently spend more than \$ 50 million annually on self-help audiotapes that involve subliminal messages. *Id.* "The industry flourishes, even though scientific testing of such tapes in areas of self esteem, memory improvement, and weight loss failed to find evidence for the effectiveness of these subliminal suggestions." *Id.* (citations omitted).

United States.⁶¹ But when other researchers failed to replicate Vicary's results and he came under pressure, it was discovered about five years later that Vicary had falsified his results.⁶²

In the 1970's, subliminal advertising made a return. In 1973, Wilson Bryan Key published a book on subliminal sexual imagery, claiming that occult and erotic images were making imprints on the subconscious mind, while escaping the radar of our conscious mind.⁶³ The consensus among the scientific fields is that Key promoted a myth, and yet, another public outcry resulted in the Federal Communications Commission releasing a policy statement against subliminal advertising in 1974.⁶⁴

Another method of studying marketing effectiveness involved experiments where researcher Herbert Krugman attached a single electrode to the back of a person's head in order to observe what [*617] happens in a person's mind when he or she watches television.⁶⁵ After conducting several such experiments in late 1969, Krugman concluded that "TV viewing tended to shift people into a passive and receptive state, characterized by alpha waves emanating in the brain."⁶⁶ He also used pupilometers, which measure the changes in pupil size, to determine what individuals were interested by, because an individual's pupils automatically dilate when something is believed to be worth paying attention to.⁶⁷

Similarly, eye tracking has been used to study how consumers react to advertisements.⁶⁸ The method of "[e]ye tracking makes a record of the path of a person's eyes when assimilating a visual message."⁶⁹ French scientists began studying eye tracking in the 1890s, discovering that eyes typically bounce from one place to another, as if the brain is trying to find the quickest way to unlock the information.⁷⁰ In the 1960's, a Russian psychologist, Alfred Yarbus, also studied eye tracking and wrote a book on eye movement which was published in America.⁷¹ Although eye tracking did not have the impact marketing researchers hoped, it is still used today in advertising design, in order to help researchers determine where individuals focus, what attracts attention first, and how individuals scan or read an advertisement, newspaper, or product package.⁷²

⁶¹ Erin J. Strahan et al., *Subliminal Priming and Persuasion: Striking While the Iron Is Hot*, 38 J. EXPERIMENTAL SOC. PSYCHOL. 556, 556 (2002). Strahan's study, however, argues for a renewed debate about the potential use and abuse of subliminal procedures in persuasion by a process called "subliminal priming." *Id.* at 567. "Subliminal priming" appears to involve subliminally presenting images to affect the subject's behavior towards a subsequently presented image. *See id.* at 556 (describing a study concluding that participants preferred Chinese ideographs that were preceded by a subliminally presented smiling face better than the same ideographs that were preceded by a subliminally presented scowling face). These subliminal priming studies remain relatively new and further research is urged. *Id.* at 567.

⁶² *Id.*

⁶³ LYNCH & LAURSEN, *supra* note 56, at 53. *See also* WILSON BRYAN KEY, *SUBLIMINAL SEDUCTION* (1973).

⁶⁴ LYNCH & LAURSEN, *supra* note 56, at 53. The statement released by the FCC asserted that "[s]ubliminal advertising is intended to be deceptive, and is contrary to public interest." *Id.*

⁶⁵ *Id.* at 51-52.

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ LYNCH & LAURSEN, *supra* note 56, at 51-52.

⁷⁰ *Id.*

⁷¹ *Id.* *See also* ALFRED L. YARBUS, *EYE MOVEMENTS AND VISION* (Lorrin A. Riggs ed., Basil Haigh trans., Plenum Press 1967).

⁷² *See* Soussan Djamshbi et al., *Generation Y, Web Design, and Eye Tracking*, 68 INT'L J. HUMAN-COMPUTER STUD. 307, 307 (2010) (discussing eye movement research to improve the effectiveness of web design in marketing to Generation Y);

A scientific measurement used by advertisers in the 1960's is the Galvanic skin response (GSR), which "measures changes of electrical conductivity on skin surfaces, which are caused by emotional reactions."⁷³ Researchers used this science to determine [*618] how people responded emotionally to marketing devices, such as brand names, background music, and advertisements.⁷⁴

While attempts to use science to make advertising more effective is certainly nothing new, neuromarketing is different. Neuromarketing has created a fundamental shift in the scientific community, as to the ability of researchers to study human emotions and cognitive processes.⁷⁵

Neuroscience and the use of brain imaging allow researchers to actually see the brain in action, and with the current scientific understanding of how the brain operates, researchers can interpret the images to determine how people process and react to advertisements. As one Virginia Mobile USA marketing executive told the New York Times in March of 2008, "[i]nstead of hypotheses about what people think and feel, you actually *see* what they think and feel."⁷⁶ Currently, the brain imaging technique used most often is the functional magnetic resonance imaging (fMRI).⁷⁷ The fMRI allows a researcher to observe the brain as it functions, using an MRI scanner to see "changes over time in the ratio of oxygenated to de-oxygenated hemoglobin in the brain."⁷⁸ The scanner measures this ratio, and under the Blood Oxygen Level Dependence ("BOLD") hypothesis, it is believed that "an influx of fresh, more highly oxygenated blood" is seen in the "areas of the brain where the neurons have recently 'fired.'"⁷⁹ Using the measurements of the scanner, a researcher is able to determine "what brain regions are active during various mental activities, by having people in a scanner see, hear, do, move, or think about something and then, a few seconds later, see which [part of the brain] had an increase in the ratio of oxygenated to de-oxygenated hemoglobin."⁸⁰ Then, researchers must interpret these images.

Rik Pieters & Luk Warlop, *Visual Attention During Brand Choice: The Impact of Time Pressure and Task Motivation*, 16 INT'L J. RES. MKTG. 1, 1 (1999) (noting that the visual attention of consumers has been largely disregarded in marketing research, but arguing that studying eye-movement is an important component of brand preference research).

⁷³ LYNCH & LAURSEN, *supra* note 56, at 53.

⁷⁴ *Id.* An Integrative Review of Sensory Marketing: Engaging the Sense to Affect Perception, Judgment and Behavior available at *Id.*

In the U.S., many food manufacturers are emphasizing how their product appeals to the different senses. For instance, Lindt chocolate's recent ad discusses the art of chocolate tasting and tells the reader exactly how to employ all five senses in tasting their chocolate. Many upscale hotel chains have adopted signature scents with the hope that the scents will help [sic] their customers better remember other features of their hotel that they loved, and bring them back. For instance, the Westin hotel chain has the signature scent of white tea with geranium and Freesia. Intel, NBC, MGM, and many other brands have signature sounds which announce that it is indeed their brand that the consumer is listening to. Bottles like those for Orangina have adopted shapes and textures that resemble the raw material of the product itself, in this case the orange, to stand out from other products, and also to appeal to the consumers' haptic sense.

Id. This attempt to use advertising to reach consumers' senses and make them react on a subconscious level is a step away from neuromarketing research, which also strives to persuade consumers on a subconscious level.

⁷⁵ LYNCH & LAURSEN, *supra* note 56, at 53.

⁷⁶ *Id.* at 48 (citing Stuart Elliott, *Is the Ad a Success? The Brain Waves Tell All*, N.Y. TIMES, Mar. 31, 2008, <http://www.nytimes.com/2008/03/31/business/media/31adcol.html>).

⁷⁷ Peter Kenning, Hilke Plassmann, & Dieter Ahlert, *Applications of Functional Magnetic Resonance Imaging for Market Research*, 10 QUALITATIVE MKT. RES.: INT'L J. 135, 139 (2007).

⁷⁸ Henry T. Greely, *Law and the Revolution in Neuroscience: An Early Look at the Field*, 42 AKRON L. REV. 687, 694 (2009). See also John C. Gore, *Principles and Practice of Functional MRI of the Human Brain*, 112 J. CLINICAL INVESTIGATION 4, 4 (2003).

⁷⁹ Greely, *supra* note 78, at 694.

⁸⁰ *Id.*

The usefulness of the images is based on current scientific understanding of how the brain functions. Most people are aware of the distinction between the left brain and the right brain, but "[t]he brain can also be categorized into three distinct parts that act as separate organs with different cellular structures and different functions."⁸¹ These three different parts have specialized functions, with the "old brain" in the center, being a primitive organ that is deemed our "survival brain."⁸² Although the "old brain" takes into account input from the other two parts of the brain, it is the actual trigger of decision.⁸³ The two newer portions of the human brain, in terms of evolution, are the "middle brain," which processes emotion and gut feelings, and the "new brain," which processes rational data.⁸⁴ Researchers, using fMRI images, can determine which of these portions of the brain is used during a given study.

Neuromarketing researchers use this understanding of how the brain functions to observe many different aspects of how consumer's brains process advertisements. Gerry Zaltman, the first researcher credited with using neuroscience in marketing research, believes that ninety-five percent of our thinking occurs subconsciously and that marketing is most successful when it makes a [*620] psychological link with our deep brain areas.⁸⁵ He asserts that "[i]f our old brain parts decide a product will make us feel connected to a larger group or help us hook up with a desirable mate, we're going to want to buy it" and that this psychological link becomes more important to marketers' strategies than actually making the best product.⁸⁶ Ale Smidts, who coined the phrase "neuromarketing," used fMRI imaging studies to prove the effectiveness of expert or celebrity product endorsements.⁸⁷ In his 2006 presentation on his work at the University of Michigan, Smidts showed that even seeing a combination of a product with a celebrity or expert just one time "leads to a long-lasting change in memory for an attitude towards the product."⁸⁸ Brian Knutson, a Stanford researcher, undertook a study of incentive processing, which looks at what the brain does when it is trying to determine whether a choice will lead to a good result (i.e., food, sexual pleasure, or money), or something bad.⁸⁹ Knutson found in his research that money really excites the brain, and he has focused his work on determining how brains react to spending, losing, or earning money.⁹⁰

An important aspect of neuromarketing research is that the researcher does not have to rely on what the individual test subjects report, but can instead observe firsthand how their brains react to advertisements. Neuroscience research has already shown that consumers' stated advertising preferences often do not always coincide with what the brain itself reveals through neuroscience im-

⁸¹ PATRICK RENVOISE & CHRISTOPHE MORIN, NEUROMARKETING: UNDERSTANDING THE "BUY BUTTON" IN YOUR CUSTOMER'S BRAIN 6 (2007).

⁸² *Id.*

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ LYNCH & LAURSEN, *supra* note 56, at 50.

⁸⁶ *Id.*

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ *Id.* at 54.

⁹⁰ LYNCH & LAURSEN, *supra* note 56, at 54.

aging.⁹¹ For example, one Boston ad agency, Arnold Worldwide, published a small private study that used fMRI machines at Harvard's McLean Hospital to see what occurred in the brains of six men between the ages of twenty-five and thirty-four when they looked at images being proposed for a 2007 campaign for Brown-Forman (their client, who owns Jack Daniel's).⁹² Because of the rich charcoal flavoring of the bourbon, the brand's advertising had long sought to create a back-woods appeal by featuring older, rural men.⁹³ However, Jack Daniel's had more recently become a favorite of many rock bands and young people who began calling it "Jack."

⁹⁴ The researchers sought to test the older advertisements with the rugged, outdoor scenes against advertisements featuring young people having fun on spring break.⁹⁵ The research subjects, all whiskey drinkers, stated overwhelmingly that they preferred the rugged, outdoorsy scene, but the neuroimaging actually showed that their brain activity was much higher when shown the pictures of the young people having fun on spring break.⁹⁶ Thus, the "fMRI not only showed that there was a gap between what the consumers *thought* that they thought and what they *really* thought, but also proved what images would fill that gap and score the best connection to the market."

⁹⁷ Neuromarketing allows companies to determine individuals' emotional responses to brands and brand preferences, even when the individual may be unaware of the brand's effect on his or her subconscious decision making.⁹⁸

Neuromarketing is also being used to gain insight far beyond establishing advertisement preferences.⁹⁹ Neuromarketing techniques [*622] may be able to clarify our understanding of the unique decision making process of consumers when it comes to intangibles, such as services.¹⁰⁰ Researchers can use fMRI images to determine which area of the brain processes stimuli, such as

⁹¹ Douglas L. Fugate, *Marketing Services More Effectively with Neuromarketing Research: A Look into the Future*, 22 J. SERVS. MKTG. 170, 171 (2008).

⁹² LYNCH & LAURSEN, *supra* note 56, at 55.

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ *Id.*

⁹⁶ *Id.*

⁹⁷ LYNCH & LAURSEN, *supra* note 56, at 55. This is an important development, because in some instances, relying on reported opinions can prove problematic. For example, when Chrysler Corporation surveyed car buyers shortly after World War II and asked potential buyers what they looked for in purchasing new cars, people reported overwhelmingly that economy and reliability were of the utmost importance in their purchase decisions. *Id.* Relying on the surveys, Chrysler put out Plymouths that were mechanically reliable but not innovative in design. *Id.* Yet, Cadillac came out around the same time with a much more flashy design, and people loved it. *Id.* at 55-56. Chrysler lost massive market share. *Id.* at 56. Apparently, even though living through the war era had made people appreciate economy and reliability, an underlying hunger for excitement existed, manifesting itself in their desires for the more exciting, flashy automobiles. LYNCH & LAURSEN, *supra* note 56, at 56.

⁹⁸ See Samuel M. McClure et al., *Neural Correlates of Behavioral Preference for Culturally Familiar Drinks*, 44 NEURON 379 (2004). Recently, after a proposed new Gap logo led to online protests, NeuroFocus, a Neuromarketing Company, decided to research how the human brain responds to bad advertising. Jessica Hamzelou, *Can Neuroscience Help Gap Produce a Better Logo?*, NEWSCIENTIST (Oct. 20, 2010), <http://www.newscientist.com/blogs/shortsharpscience/2010/10/normal-0-false-false-2.html>. The company used EEC and eye-tracking techniques to investigate the neural responses of volunteers being shown the old and new Gap logos. *Id.* NeuroFocus found that the new logo did not register as novel or stylish in the volunteers' brains. *Id.* NeuroFocus issued a press release outlining "neurological best practices" for creating brand images. *Id.*

⁹⁹ Fugate, *supra* note 91. See generally ERIK DU PLESSIS, *THE ADVERTISED MIND: GROUND BREAKING INSIGHTS INTO HOW OUR BRAINS RESPOND TO ADVERTISING* (2005); Peter Kenning et al., *Applications of Functional Magnetic Resonance Imaging for Market Research*, 10 QUALITATIVE MKT. RES.: INT'L J. 135 (2007); Nick Lee et al., *What is Neuro-marketing? A Discussion and Agenda for Future Research*, 63 INT'L J. PSYCHOPHYSIOLOGY 199 (2007); Sam M. McClure et al., *Separate Neural Systems Value Immediate and Delayed Monetary Rewards*, 306 SCI. 503 (2004).

¹⁰⁰ Fugate, *supra* note 91, at 171.

those areas associated with "trust," "responsiveness," or "empathy."¹⁰¹ Neuromarketing can be used to develop pricing strategies that are more effective.¹⁰² Neuroscience has even been used to predict the shopping behavior of consumers by observing brain functioning before an individual makes a decision about purchasing a product.¹⁰³ [*623] A year-long study was conducted in which fMRI machines were used to observe individuals' brains while making purchasing decisions.¹⁰⁴ During the study, a product would appear on a screen in front of each individual, followed by a purchase price, and then the individual was given an option between "yes" (to purchase the product) and "no" (to decline to purchase the product).¹⁰⁵ In most of the trials, the buying was imaginary, but in two of the trials, the individuals were given \$ 20 to make purchases of real products.¹⁰⁶ The imaging revealed that a certain midbrain area, thought to be part of our mental reward center, was very active when the products were first shown and that when the price was revealed, an area of our newer brain became active (a portion connected with rational thinking and weighing decisions).¹⁰⁷ The researchers were eventually able to determine from the brain imaging whether an individual would choose to purchase the product before the individual had indicated his or her choice.¹⁰⁸ The implications of this discovery could be wide-ranging, as predicting consumer purchase behavior is the holy grail for advertising and marketing companies.

Ultimately, the use of neuroscience to make advertising more effective has vast potential and is already working on some levels.¹⁰⁹ In a relatively short period of time, much has been discovered in the realm of neuromarketing.¹¹⁰ Further, "[e]ach year more powerful advances in brain scanning technology emerge, and those advances get into the hands of more and more researchers . . . [meaning that] fundamentally new neurosensing technology will [*624] emerge over the next decade driven by the extraordinary economic value inherent in understanding the human mind."

¹⁰¹ *Id.*

¹⁰² *Id.Id.Id.Id.supraId.Id.Id.Id.Why Broadview Security Keeps Making Ads that Scare the Hell Out of UsSee id.Id.*

Brian Knutson and Antonio Rangel of Cal Tech collaborated on a study and arrived at similar conclusions about pricing strategies. LYNCH & LAURSEN, *supra* note 56, at 62. The researchers discovered that people perceive that their enjoyment of a wine will be greater when it has a higher price. *Id.* They observed that the higher the price of the wine was, the more activity occurred in the medial orbitofrontal cortex of the brain. *Id.* The researchers asserted that they could affect the amount of activity in the part of the brain that encodes for subjective pleasantness by changing the price at which subjects thought the product was sold, without making any changes to the actual product. *Id.* Ultimately, the researchers concluded that fMRI-based studies of the brain's reaction to advertisements and prices will make them more effective. *Id.*

¹⁰³ LYNCH & LAURSEN, *supra* note 56, at 61.

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*

¹⁰⁸ LYNCH & LAURSEN, *supra* note 56, at 61.

¹⁰⁹ Even in 2007, researchers were saying that "initial studies show that a reliable and valid application of functional brain imaging techniques to consumer research questions is possible. In particular, the initial fMRI studies in the field seem promising." Kenning, *supra* note 99, at 148. As early as 2002, Emory University's Neuromarketing Research Institute claimed that it could "identify patterns of brain activity that reveal how a consumer is actually evaluating a product, object or advertisement . . . to help marketers better create products and services and to design more effective marketing campaigns." Douglas Rushkoff, *Reading the Consumer Mind: The Age of Neuromarketing Has Dawned*, CENTER FOR COGNITIVE LIBERTY (Feb. 2004), http://www.cognitiveliberty.org/neuro/Rushkoff_Neuromarketing.html.

¹¹⁰ Further, one researcher at Baylor has just put together a five-unit complex of scanners to study how the brain functions in group settings, in an effort to discover the effects of social pressure on individuals, which is undoubtedly useful information for marketing companies. LYNCH & LAURSEN, *supra* note 56, at 68-69.

¹¹¹ Companies have already been established that specialize in neuromarketing, and they claim to have big clients demanding their research. ¹¹² There are now books promising that neuromarketing technology can enable sellers to “dramatically increase” selling effectiveness and “reach . . . sustained higher level[s] of success in all . . . sales, marketing, and communication efforts.”

¹¹³ With neuromarketing companies making these types of claims, it is obvious why more money is being poured into neuromarketing research each year by private companies that are looking to increase the effectiveness of their marketing. Manufacturers were already spending an estimated \$ 8 billion per year on marketing research, and this number continues to increase, especially with the new potential of neuromarketing. ¹¹⁴

[*625] A concern that arises with the dramatic increase in neuromarketing research is that much of the research is being done in private forums and is unregulated. While research conducted in universities is published and reviewed by academic peers who criticize and test the theories, public funding is limited and government agencies, such as the National Institute of Health

¹¹¹ *Id.* at 70.

¹¹² *See id.*

San Francisco’s EmSense, which measures brain activity ‘for a moment-by-moment analysis of how audiences respond to advertisements’; London’s NeuroCo and Neuro-Sense; Berkley’s NeuroFocus, which is ‘applying the latest advances in neuroscience to the world of advertising and messaging’; Atlanta’s BrightHouse; FKF Applied Research of Los Angeles, the self-proclaimed ‘Leader in NeuroMarketing’; and Boston-based Arnold World-wide and Digitas.

Id. *See also* A.K. PRADEEP, *THE BUYING BRAIN: SECRETS FOR SELLING TO THE SUBCONSCIOUS MIND* 7(2010) (discussing advances made by his organization, NeuroFocus).

¹¹³ RENVOISE & MORIN, *supra* note 81, at 4; *see also* PRADEEP, *supra* note 112; MARTIN LINDSTROM, *BUYOLOGY: TRUTH AND LIES ABOUT WHY WE BUY* (2008).

¹¹⁴ *Taking Behaviorism Seriously: Some Evidence of Market Manipulation* 112 HARV. L. REV. 1420, 1429 (1999). *See id.*

Further, a more recent study from the American Psychological Association, published in 2004, concluded that in the year 2000, advertisers spent \$ 12 billion on advertising messages aimed at the youth market. *Television Advertising Leads to Unhealthy Habits in Children; Says APA Task Force*, AM. PSYCHOL. ASS’N (Feb. 23, 2004), <http://www.apa.org/news/press/releases/2004/02/children-ads.aspx>. The study was conducted to determine the amount of exposure adolescent children had to advertisements. *Id.* Researchers found that the average American adolescents were exposed to approximately 40,000 television commercials per year. *Id.* However, what is more startling is that the study did not take into account billboards, newspaper, radio advertising, point-of-sale displays, direct mail, flyers, and uncountable other types of promotion or advertisement. *Id.* Another study that covered expenditures on all traditional advertising forms reported that national advertisers spent \$ 105 billion on advertising in 2006. Bradley Johnson, *Leading National Advertisers Report: Spending Up 3.1% to \$ 105 Billion*, ADVERTISING AGE (June 25, 2007), http://adage.com/print?article_id=118648. And yet another source puts the number for spending in the United States on all traditional advertising at \$ 152.3 billion. *TNS Media Intelligence Forecasts 1.7 Percent Increase in U.S. Advertising Spending for 2007*, TNS (June 12, 2007), <http://www.tnsglobal.com/news/news-41B1D08CEF094A98AAD79C2FABF263EB.aspx>. While these amounts are staggering, even these figures do not take into account guerilla advertising campaigns or “stealth marketing” campaigns that marketers or public relation firms also spend money on. “Stealth Marketing” is an industry term for word-of-mouth advertising, where advertisers directly market to consumers in a manner that appears as if it is not marketing, because the person delivering the message is an actor posing as a friendly stranger or a friend paid to promote a product. *See generally* Deborah Branscum, *Marketing Under the Radar*, CMO MAG., Dec. 22, 2004; Ellen P. Goodman, *Stealth Marketing and Editorial Integrity*, 85 TEX. L. REV. 83 (2006). Another example of similar tactics used in marketing is paying celebrities to make endorsements over social media without disclosing their paid relationship, which actually has caused quite an uproar in the United Kingdom and in the United States, prompting responses from the United Kingdom’s Office of Fair Trading and the U.S. Federal Trade Commission. *See* Richard Dickinson & Tiana Russell, @AdLawBlog: *Undisclosed #Celebrity #Endorsements for Tweets Tick Off UK and US Regulators* #gov, ARNOLD & PORTER LLP: CONSUMER ADVER. L. BLOG (Jan. 14, 2011), <http://www.consumeradvertisinglaw-blog.com/2011/01/undisclosed-celebrity-endorsements-for-tweets-tick-off-uk-and-us-regulators.html>; *FTC Publishes Final Guides Governing Endorsements, Testimonials*, FED. TRADE COMMISSION (Oct. 5, 2009), <http://www.ftc.gov/opa/2009/10/endortest.shtml>. Ultimately, the amount of money poured into advertising is innumerable. Given this proven willingness to spend, marketers will most definitely continue to invest massive amounts of funds into making all those advertising expenditures more effective.

("NIH"), often limit the funding they provide to only fundamental or groundbreaking studies.¹¹⁵ The nearly \$ 8 billion spent on marketing research by private firms is being used to search for competitive edges that will be kept hidden, preventing the kind of peer scrutiny and testing that ensure scientific reliability and the consideration of ethical implications.¹¹⁶ The only reason that public knowledge exists about some emerging firms that offer neuromarketing consultations is that universities lease time in their laboratories to these private companies in order to alleviate the costs of their multi-million dollar neuroscience equipment.¹¹⁷ Neuromarketing research also remains largely unregulated by any government agencies. Traditional methods of marketing research have not been subject to Institutional Review Board ("IRB") oversight, because they are not usually viewed as experimentation, and although MRI scans are approved by the United States Food and [*626] Drug Administration ("FDA") for clinical use, no diagnosis is being made in the marketing setting, so companies are able to avoid both FDA and IRB requirements.¹¹⁸ Ultimately, much of the progress of neuromarketing remains unknown and unchecked, but what has been published or released shows that neuroscience has significant potential and is already being used to make marketing more effective.

The future possibilities for neuromarketing are exciting to researchers and companies that are hoping to profit from the neuromarketing research, but some researchers are concerned. One researcher addressed potential positive and negative uses of neuromarketing, stating that "[p]roduct manufacturers could use neural information to coerce the public into consuming products that they neither need nor want. However, we hope that future uses of neuromarketing will help companies to identify new and exciting products that people want and find useful."¹¹⁹ Some groups, such as "Commercial Alert," fear that because marketing is so deeply implicated in much serious pathology, neuromarketing will only amplify harmful trends, like childhood obesity or smoking.¹²⁰ Other researchers called it a "real possibility" that a "super-heroin of food products" could be created, where the food product is so "highly tuned to neural responses that individuals may over-eat and become obese."¹²¹ Another researcher anticipates that "this technology will further accelerate the mass customization of advertisements, [*627] tailored to the emotional state of the viewers" and that "[t]o counter these more sophisticated techniques, neuromarketing alert systems will emerge to identify when and where these crafty, subtle techniques

¹¹⁵ LYNCH & LAURSEN, *supra* note 56, at 49, 54.

¹¹⁶ *Id.* at 48, 54; *see also* Fugate, *supra* note 91, at 172 (discussing how 90 neuromarketing consultancies have been formed in the United States and in Europe, and that these agencies boast clients that are Fortune 500 manufacturers and big service firms like McDonald's, movie studios, large banks, and even a few political campaigns).

¹¹⁷ LYNCH & LAURSEN, *supra* note 56, at 54.

¹¹⁸ Dan Ariely & Gregory S. Berns, Neuromarketing: The Hope and Hype of Neuroimaging in Business, 11 NATURE REVS. 284, 289 (2010), *available at* <http://www-psych.stanford.edu/~knutson/bad/ariely10.pdf>.

¹¹⁹ *Id.* at 291.

¹²⁰ Neuromarketing: A Layman's Look at Neuroscience and Its Potential Application to Marketing Practices *see also supra*

[M]arketers can induce consumer to make bad purchasing choices by exploiting the biologically determined structure of the brain. Presumably, visual images (the part of the brain that deals with sight is more developed than the one that deals with the more recently acquired language skills) and emotions (which . . . is the basis for all human behavior) could influence consumers to willingly respond to marketing influences that they themselves are unaware of and cannot control.

Id.

¹²¹ Ariely & Berns, *supra* note 118, at 289. The authors raise other ethical issues with neuromarketing, including: neuroimaging being used to gauge a person's preferences outside of the specific task being performed; brain responses from a small group of subjects being used to generalize to a larger population; companies aiming to maximize their short or long-term profits to the detriment of their customers; and the potential use of neuroimaging data to target marketing to specific people or groups who are believed to have a biological "weakness" that makes them more susceptible. *Id.*

are being employed.”¹²² It has even been hypothesized by scientific researchers that “governments may even go so far as to screen and label [advertisements customized with neuromarketing research] with specific warnings about its intimately invasive nature, to protect undereducated, unaware communities from the rapid expansion of these technologies.”¹²³

Given the potential uses of neuromarketing and the predictions of some researchers, it is easy to understand why government regulation of neuromarketing has been surmised. It is important then to consider how the commercial speech doctrine of the First Amendment would apply to such a regulation and whether the government can constitutionally regulate the use of neuromarketing research by advertising companies.

IV. POTENTIAL REGULATION OF NEUROMARKETING UNDER THE COMMERCIAL SPEECH DOCTRINE

A. Neuromarketing Could Create an Unfair Bargaining Process

Some groups are already urging for a complete ban by the government of neuroscience research in marketing.¹²⁴ A ban of neuromarketing (any advertisements or products produced with the use of neuroscience research) would likely survive constitutional scrutiny if scientific research is available to support the conclusion that neuromarketing can manipulate consumers. The use of neuroscience to make advertising more effective could create an unfair bargaining process, such that neuromarketing falls outside of the protection of the First Amendment under the commercial speech doctrine. The same rationale for denying protection to false or misleading speech in advertising also applies to unfairly effective neuromarketing, meaning that the government could constitutionally regulate the use of neuromarketing.

The first prong of the *Central Hudson* analysis asks whether the commercial speech “concern[s] lawful activity and [is] not misleading,” in order to determine whether the expression is protected by the First Amendment at all, as a negative answer to the first question would end any further inquiry.¹²⁵ Many cases have held that commercial speech that is false or misleading is not entitled to First Amendment protection and may be prohibited entirely.¹²⁶ The rationale underlying this prong of the *Central Hudson* test is that government regulation of misleading commercial speech is necessary to preserve a fair bargaining process between the advertiser and the consumer.¹²⁷ Because commercial speech is generally defined as “speech which does no more than propose a commercial transaction,”¹²⁸ the contractual nature of the speech allows for government-

¹²² LYNCH & LAURSEN, *supra* note 56, at 72.

¹²³ *Id.*

¹²⁴ See e.g., Fugate, *supra* note 120.

¹²⁵ [Cent. Hudson Gas & Electric Corp. v. Pub. Serv. Comm’n of N.Y.](#), 447 U.S. 557, 566 (1980).

¹²⁶ Cecil C. Kuhne, III, *Testing the Outer Limits of Commercial Speech: Its First Amendment Implications*, 23 REV. LITIG. 607, 610 (2004) (citing [In re R.M.J.](#), 455 U.S. 191, 203 (1982)); [Edenfield v. Fane](#), 507 U.S. 761, 768 (1993); [Bolger v. Youngs Drug Prods. Corp.](#), 463 U.S. 60, 69 (1983); [Zauderer v. Office of Disciplinary Council](#), 471 U.S. 626, 638 (1985); *Cent. Hudson*, 447 U.S. at 566; [Bates v. State Bar of Ariz.](#), 433 U.S. 350, 383 (1977)).

¹²⁷ Kuhne, *supra* note 126, at 612 (“[W]hen the government regulates commercial messages to protect consumers from misleading, deceptive, or aggressive sales practices, it does so in order to maintain a fair bargaining process.”).

¹²⁸ [Va. State Bd. of Pharmacy v. Va. Citizens Consumer Council, Inc.](#), 425 U.S. 748, 762 (1976). But see *supra* note 54 (describing the difficulty of defining commercial speech).

tal regulation in order to prevent undue influence.¹²⁹ Under contract law, coercive or misleading speech can invalidate contracts, and therefore, it makes sense that regulation of coercive or misleading commercial speech is permissible.¹³⁰

It is true that advertisements created with the use of neuromarketing research may not be presenting factually false information and are not misleading in the traditional sense. However, the argument can be (and has been) made that neuromarketing could become so effective that it may cause consumers to believe that they want or need products that they actually might not,¹³¹ and therefore, even while the information provided may not necessarily be factually misleading, it certainly creates an unfair bargaining process. The very same rationale which underlies denying any First Amendment protection to false or misleading speech applies to potentially coercive or overly effective neuromarketing, which can be tailored to appeal to the subconscious decision making of consumers. In fact, prohibiting coercive neuromarketing is essential to preserving a fair bargaining process, and therefore, [*629] the government could prohibit neuromarketing entirely and the Court could uphold it on this basis.

In *Bates v. State Bar of Arizona*, the Supreme Court struck down state limitations on attorney advertising under *Central Hudson*,¹³² but noted that in-person solicitation of clients in situations that breed "undue influence by attorneys" might well pose dangers of "overreaching and misrepresentation."¹³³ Later, in two companion cases, the Court again discussed the potential for overreaching or coercion with in-person solicitation by attorneys.¹³⁴ The Court recognized that the state had an interest in protecting the "unsophisticated, injured, or distressed lay person"¹³⁵ from "those aspects of solicitation that involve fraud, undue influence, intimidation, overreaching, and other forms of vexatious conduct."¹³⁶ While the Court was careful not to create any broad rules governing in-person solicitation, the Court was clearly concerned about the potential for undue influence or coercion in these cases.¹³⁷ Thus, the Court may be persuaded that the poten-

¹²⁹ See Daniel A. Farber, *Commercial Speech and First Amendment Theory*, 74 Nw. U. L. Rev. 372, 390-94 (1979).

¹³⁰ *Id.*

¹³¹ Ariely and Berns, *supra* note 118, at 291.

¹³² [Bates v. State Bar of Ariz., 433 U.S. 350, 384 \(1977\).](#)

¹³³ *Bates*, 433 U.S. at 366.

¹³⁴ [In re Primus, 436 U.S. 412 \(1978\); Ohralik v. Ohio State Bar Ass'n, 436 U.S. 447 \(1978\).](#)

¹³⁵ Ohralik, 436 U.S. at 465 (footnote omitted). The quoted language is actually very similar to the language used by one scientific researcher in predicting why government regulation of neuromarketing may occur, stating that "governments may even go so far as to screen and label [advertisements customized with neuromarketing research] with specific warnings about its intimately invasive nature, to protect undereducated, unaware communities from the rapid expansion of these technologies." LYNCH & LAURSEN, *supra* note 56, at 72.

¹³⁶ Ohralik, 436 U.S. at 462.

¹³⁷ *Ohralik*, 436 U.S. at 449.

On the basis of the undisputed facts of record, we conclude that the Disciplinary Rules constitutionally could be applied to appellant. He approached two young accident victims at a time when they were especially incapable of making informed judgments or of assessing and protecting their own interests. He solicited Carol McClintock in a hospital room where she lay in traction and sought out Wanda Lou Holbert on the day she came home from the hospital, knowing from his prior inquiries that she had just been released. Appellant urged his services upon the young women and used the information he had obtained from the McClintocks, and the fact of his agreement with Carol, to induce Wanda to say "O.K." in response to his solicitation. He employed a concealed tape recorder, seemingly to insure that he would have evidence of Wanda's oral assent to the representation. He emphasized that his fee would come out of the recovery, thereby tempting the young women with what sounded like a cost-free and therefore irresistible offer. He refused to withdraw when Mrs. Holbert requested him to do so only a day after the initial meeting between appellant and Wanda Lou and continued to represent himself to the insurance company as Wanda Holbert's lawyer.

tial for neuromarketing to be overly persuasive, to the point of being coercive or misleading, is significant enough to justify a state's interest in regulating it in order to protect its citizens.¹³⁸

Were it presented with such a regulation today, the Court may not be inclined to find neuromarketing false or misleading and exclude it entirely from First Amendment protection under the first prong of *Central Hudson*, because the currently published science and research does not yet support the firm conclusion that neuromarketing is overly effective, to the point of manipulation or coercion.¹³⁹ However, with such rapid advances in the field of neuromarketing, were scientific data soon available to support the notion that neuromarketing is so effective, then the Court may be persuaded to deny it any First Amendment protection.

Confusingly, there is a complete lack of empirical data about advertising and its effectiveness in the briefs and arguments that frame the Supreme Court's commercial speech cases.¹⁴⁰ In fact, it was not until its decision in *44 Liquormart*, decided sixteen years after *Central Hudson*, that the Supreme Court made any reference in a commercial speech case to scientific research on whether advertising impacts the consumption of products, referring to a single study conducted by the Federal Trade Commission on advertising and liquor consumption.¹⁴¹ Still, *44 Liquormart*, and a subsequent major commercial speech case, *Greater New Orleans Broadcasting Association, Inc. v. United States*,¹⁴² both appear to actually cast doubt on the fairly common notion that advertising affects consumer behavior and demand for products.¹⁴³ If courts were presented today with empirical data that advertising does, in fact, affect consumer behavior and further research showing the potential uses of neuromarketing, this first prong of the *Central Hudson* analysis may be revised or interpreted differently, in order to allow more government regulation of commercial speech.

The Supreme Court may be persuaded to revise the *Central Hudson* analysis, because the rationales included in early Supreme Court decisions for affording commercial speech First Amend-

Id. at 467. The Court was apparently hesitant to create any broad, per se rule against in-person solicitation.

The *In re Primus* companion decision dealt with a lawyer who received a public reprimand for advising a lay person about her legal rights in person and then disclosing in a subsequent letter that free legal assistance is available. 436 U.S. at 414. In holding the state's reprimand of the lawyer unconstitutional, the Court distinguished *Primus* from *Ohralik* by concluding that the lawyer's affiliation with the American Civil Liberties Union and the absence of fraud, overreaching, or other regulable behavior meant that the solicitation fell within the zone of political speech and association protected in [NAACP v. Button, 371 U.S. 415 \(1963\)](#). *Id.* at 435-37. The court also noted the distinction between the letter and the potential for undue influence with in-person solicitation in circumstances such as in *Ohralik*, stating that "[t]he letter was not facially misleading; indeed, it offered 'to explain what is involved so you can understand what is going on.' The transmittal of this letter--as contrasted with in-person solicitation--involved no appreciable invasion of privacy; nor did it afford any significant opportunity for overreaching or coercion." *Id.* at 435 (footnote omitted).

¹³⁸ Another potentially serious issue is how the Court would handle a government regulation of advertising for political campaigns that are produced with neuromarketing strategies. Apparently, political campaigns are already seeking the help of neuromarketing consultancies in the United States. Fugate, *supra* note 91, at 172. Political speech is one of the most protected forms of speech under the First Amendment because it facilitates the democratic process and our own self-government. CHEMERINSKY, *supra* note 9, § 11.1.2. On the other hand, the right to vote is a fundamental right under the constitution and is at the heart of our government system. If political advertisements were created with the use of neuromarketing strategies and become coercive and manipulative of the decision-making processes of citizens, this would infringe on the fundamental rights of citizens to vote. How the Court might handle this conflict of constitutional rights is beyond the scope of this article, and necessarily left for another day.

¹³⁹ See Fugate, *supra* note 120, at 391.

¹⁴⁰ Sarah C. Haan, Note, "The Persuasion Route" of the Law: Advertising and Legal Persuasion, [100 COLUM. L. REV. 1281, 1311 \(2000\)](#).

¹⁴¹ *Id.*

¹⁴² [527 U.S. 173 \(1999\)](#).

¹⁴³ Haan, *supra* note 140, at 1311.

ment protection are completely undermined by the advertisements of today.¹⁴⁴ Advertisements are continuously less informative about products and use visual images and techniques designed to appeal to consumers on a subconscious level, becoming increasingly effective with these strategies due to neuromarketing research. The current lack of information in advertisements certainly does not contribute to "intelligent and well informed" consumer decisions and to "the free flow of commercial information" that is "indispensable to the formation of intelligent opinions as to how [society] ought to be regulated or altered," as the Supreme Court justified protecting commercial speech in *Virginia Board*.¹⁴⁵

Ultimately, if scientific research becomes available to support the notion that neuromarketing advertisements are so effective that an unfair bargaining process is created and consumers are misled, a complete ban of neuromarketing by the government could pass a constitutional challenge, even under the current *Central Hudson* framework. While advertising created with the use of neuromarketing techniques may not qualify as factually false or misleading, the advertisements could certainly become coercive and create an unfair bargaining process, if what some researchers are predicting materializes. The same rationales would be applicable to manipulative neuromarketing advertisements that support denying false or misleading commercial speech any First Amendment protection under *Central Hudson*. Neuromarketing would thus not be granted First Amendment protection under the commercial speech doctrine, and the government could constitutionally enact a ban prohibiting it entirely. However, given the Supreme Court's past commercial speech decisions, it may be hesitant to exclude neuromarketing from First Amendment protection entirely, so the full *Central Hudson* analysis must be considered.

B. Substantial Government Interests Support Neuromarketing Regulations Under Central Hudson

Even if the Court was not inclined to conclude that neuromarketing falls outside of the protection of the First Amendment, a complete ban of neuromarketing may still be upheld under the full *Central Hudson* four-part analysis, because the government interest in preventing consumer manipulation is so substantial. If the Court concludes under the first prong of *Central Hudson* that commercial speech concerns lawful activity and is not misleading, the commercial speech is afforded some protection under the First Amendment.¹⁴⁶ Then, the Court must consider the rest of the *Central Hudson* four-part analysis in order to determine whether the government regulation of the commercial speech is constitutional.¹⁴⁷ Although the four parts of the *Central Hudson* analy-

¹⁴⁴ Some commentators have argued that commercial speech should receive little to no First Amendment protection at all. See C. Edwin Baker, *The First Amendment and Commercial Speech*, 84 IND. L.J. 981, 981 (2009) ("The world would do well not to follow the lead of the United States in its view that commercial speech is an aspect of free speech."); Fischette, *supra* note 54, at 687 ("One might argue that [an analysis of the landmark Supreme Court commercial speech decisions] has shown that commercial speech has political relevance, but only at the cost of showing that almost everything does. That would make all speech subject to First Amendment protection, a conclusion few are willing to reach."); Piety, *supra* note 54, at 2584 ("There are good reasons to conclude that protection for the freedom of speech of commercial entities should not excite our tenderest solicitude—at least not as a matter of First Amendment.").

¹⁴⁵ *Va. State Bd. of Pharmacy v. Va. Citizens Consumer Council, Inc.*, 425 U.S. 748, 765 (1976). Another author has commented on the dramatic change in advertising since the 1970s and the striking decline in the "informativeness" of advertisements. See Haan, *supra* note 140, at 1287. One then wonders whether the Supreme Court commercial speech cases might come out differently if analyzing the advertisements of today and with justices who had more exposure to current marketing strategies. As Haan noted in her discussion of persuasion in advertising and in the law, "young judges today represent the first generation of magistrates to have experienced full-force the revolution in marketing to children-- Supreme Court Justice Clarence Thomas, for example, was about fifteen-years old when the first ad agency targeting children opened for business." *Id.* at 1322.

¹⁴⁶ *Cent. Hudson Gas & Electric Corp. v. Pub. Serv. Comm'n of N.Y.*, 447 U.S. 557, 566 (1980).

¹⁴⁷ See *Rubin v. Coors Brewing Co.*, 514 U.S. 476, 482-83 (1995) (outlining the *Central Hudson* test and noting that because both parties agreed the advertisements only sought to disclose "truthful, verifiable, and nonmisleading factual information," the analysis for determining constitutionality focused on the remaining factors of the test).

sis are not entirely distinct inquiries and are quite interrelated, each prong raises a relevant question that, although not dispositive itself, informs the judgment concerning the other three prongs.¹⁴⁸

The second prong of *Central Hudson* asks “whether the asserted governmental interest is substantial.”¹⁴⁹ I propose two governmental interests that could be asserted to support a complete ban of neuromarketing and analyze each under the full *Central Hudson* inquiry. If scientific research becomes available to support the predicted manipulative potential of neuromarketing, the Court would likely uphold a ban of neuromarketing under either governmental interest, but as discussed below, the level of scrutiny throughout the analysis would be different.

Related to the argument for excluding neuromarketing from First Amendment protection entirely, one potential governmental interest for a ban of neuromarketing could be an interest in preserving a fair bargaining process by preventing overly effective advertising (i.e., preventing consumers from making choices based on advertising that appeals to their subconscious, bypassing any rational analysis of actual needs or wants). A second potential governmental interest could be based on a desire to prevent companies from using neuromarketing to increase the consumption of harmful products or the overconsumption of benign products.¹⁵⁰ The first government interest may receive more deference under [*634] current commercial speech precedents, because the governmental interest is directly related to the commercial speech itself and its effect on the bargaining process.¹⁵¹ The second governmental interest focuses more on the end result, in that it looks to regulate ultimate consumer choices, so a proposed ban of neuromarketing under this governmental interest may receive a more stringent review.¹⁵² Therefore, although both governmental interests would be deemed substantial,¹⁵³ the level of deference throughout the analysis may be affected because of how the specific governmental interest is tailored.

The third prong of the *Central Hudson* analysis necessitates a review of whether the regulation directly advances the governmental interest asserted.¹⁵⁴ The Supreme Court has instructed that “[t]his burden is not satisfied by mere speculation or conjecture; rather, a governmental body seeking to sustain a restriction on commercial speech must demonstrate that the harms it recites are

¹⁴⁸ Greater New Orleans, 527 U.S. at 183-84. “Partly because of these intricacies, petitioners as well as certain judges, scholars, and amici curiae have advocated repudiation of the *Central Hudson* standard and implementation of a more straightforward and stringent test for assessing the validity of governmental restrictions on commercial speech” however, “*Central Hudson*, as applied in our more recent commercial speech cases, provides an adequate basis for decision.” Id. at 184.

¹⁴⁹ Cent. Hudson, 447 U.S. at 566.

¹⁵⁰ Problems have already arisen with the consumer-driven nature of current society. See Andrew N. Christopher & Barry R. Schlenker, *Materialism and Affect: The Role of Self-Presentational Concerns*, 23 J. SOC. & CLINICAL PSYCHOL. 260, 260 (2004) (“[R]esearch suggests that a materialistic orientation is associated with lower levels of psychological well-being.”). If neuromarketing advertisements become capable of increasing consumption of even products that are not inherently harmful to society, rampant overconsumption of these products could still have harmful effects. Overconsumption of any product can not only have harmful environmental effects, but also can cause feelings of emptiness and dissatisfaction in individuals. See *id.* at 261-63. Therefore, a substantial governmental interest may include consumption of harmful products or overconsumption in general.

¹⁵¹ See 44 *Liquormart Inc. v. Rhode Island*, 517 U.S. 484, 501 (1996). See also *Commercial Speech--Advertising*, 110 HARV. L. REV. 216, 219-20 (1996).

¹⁵² 44 *Liquormart*, 517 U.S. at 501. See also Cent. Hudson, 447 U.S. at 566 n.9 (stating that courts should review complete bans on commercial speech that are motivated by policies unrelated to the speech itself with “special care”).

¹⁵³ In the above discussed commercial speech cases, the Court easily moved through the second prong, recognizing as substantial any government interest intended to protect public health, safety, or consumers themselves. See e.g., *Greater New Orleans Broad. Ass’n, Inc. v. United States*, 527 U.S. 173 (1999); 44 *Liquormart*, 517 U.S. at 484; Cent. Hudson, 447 U.S. at 557.

¹⁵⁴ Cent. Hudson, 447 U.S. at 566.

real and that its restriction will in fact alleviate them to a material degree.”¹⁵⁵ A regulation that provides “only ineffective or remote support for the government’s purpose” will not be sustained.¹⁵⁶

The availability of scientific research to prove the manipulative effects of neuromarketing is critical at this step of the analysis for either governmental interest. If researchers are able to accomplish the types of results currently being predicted, a complete ban on neuromarketing-produced commercial speech would be directly related to preventing the very real harm that the advertisements may persuade consumers on a subconscious level to purchase products that rationally, they may neither need nor want. Under the first governmental interest then, a complete ban of neuromarketing would easily pass this step of the *Central Hudson* analysis. Yet, even though this regulation is tied directly to the bargaining process and the commercial speech itself, evidence is necessary to support the notion that a complete ban on neuromarketing is needed. Under the current state of scientific research, the government would have a difficult time proving the harm is real. It appears that sufficient scientific research does not currently exist to support the proposition that with neuromarketing, consumers will lose all ability to make rational decisions in the bargaining process and can be manipulated. Therefore, scientific research would be necessary for a complete ban of neuromarketing to satisfy this prong of the *Central Hudson* analysis, based on the governmental interest of preserving a fair bargaining process.

The second governmental interest (preventing overconsumption of harmful products or overconsumption of benign products) is more problematic under this step of the *Central Hudson* analysis, because commercial speech cases have generally held that there is no direct link between advertising and consumer behavior.¹⁵⁷ This governmental interest seeks to prevent harmful consumer behavior and generate an end result that is not directly related to the bargaining process itself, which means it will likely be subject to a more stringent review.¹⁵⁸ As previously mentioned, the Supreme Court has not been presented with strong empirical data as to the effects of marketing on consumer behavior. If the Court were presented with such data regarding the effectiveness of advertisements produced with the use of neuromarketing research, it might find that a ban of such advertisements is directly linked to over-consumption of harmful products promoted by those advertisements. If the neuromarketing science advances to the levels predicted and research becomes available (and the court is receptive to it) to support the predictions that neuromarketing will become manipulative, a ban of neuroscience-produced advertising could pass this step of the analysis. It would be very important for the scientific research to clearly show that neuromarketing manipulates consumers and affects consumer behavior. Only then would a complete ban of neuromarketing be directly related to this governmental interest of preventing consumption of harmful products or overconsumption of benign products.

Finally, under *Central Hudson*, the governmental regulation must be no more extensive than necessary to serve the governmental interest.¹⁵⁹ This part of the analysis complements the third inquiry as to the direct advancement of the governmental interest. The government is not required “to

¹⁵⁵ [Edenfield v. Fane, 507 U.S. 761, 770-71 \(1993\).](#)

¹⁵⁶ *Greater New Orleans*, 527 U.S. at 188.

¹⁵⁷ *Haan*, *supra* note 140, at 1310-11.

¹⁵⁸ *Commercial Speech*, *supra* note 151, at 219-20. *See also 44 Liquormart*, 517 U.S. at 500; *Cent. Hudson*, 447 U.S. at 566 n.9 (stating that courts should review complete bans on commercial speech that are motivated by policies unrelated to the speech itself with “special care”).

¹⁵⁹ *Cent. Hudson*, 447 U.S. at 566.

employ the least restrictive means conceivable, but it must demonstrate narrow tailoring of the challenged regulation to the asserted interest--'a fit that is not necessarily perfect, but reasonable.'"

¹⁶⁰ This "fit" need not represent the "single best disposition but one whose scope is in proportion to the interest served." ¹⁶¹

Under this analysis, it is likely that with scientific support, a complete ban of neuromarketing-produced commercial speech could be upheld, under either asserted governmental interest. First, a complete ban of commercial speech produced with the use of neuromarketing research would prevent the coercion of, or undue influence on, consumers that creates an unfair bargaining process, but would not prevent the dissemination of useful commercial information. Advertisers would be free to implement any other means of communication to promulgate the same information to the public that would have been contained in the neuromarketing advertisements. Further, any proposed, lesser alternatives may not be as effective at preventing consumer manipulation. Consumers may not be deterred by warnings about neuromarketing, or may not understand them, and enforcement of government-required warnings may be difficult. Government-sponsored education about the manipulative effects of neuromarketing may be similarly ignored by, or confusing to, consumers. Therefore, under the first proposed governmental interest relating to a fair bargaining process, a complete ban of neuromarketing would not be more extensive than necessary to serve that interest.

A complete ban of neuromarketing based on the second governmental interest will again be considered with heightened scrutiny, because it relates to the end result of the speech (over-consumption of products). ¹⁶² There may be many alternatives that are more effective in preventing consumption of harmful products or over-consumption of benign products. However, a complete ban [*637] of neuromarketing could still be permissible under this governmental interest, if the scientific research becomes available to clearly demonstrate the manipulative effect of neuromarketing. This would provide support to the argument that a government regulation of the commercial speech regarding products, rather than a regulation of the actual manufacture or sale of the products, is a narrowly tailored means to achieve this governmental interest. Then, the Court might find a complete ban of neuromarketing constitutional, under this governmental interest, considering the alternative means of communication available to advertisers and the more restrictive measures that the government could take.

Therefore, it is likely that if scientific research becomes available that supports the claims and predictions of neuromarketing researchers, a complete ban of neuromarketing by the government could be upheld under the *Central Hudson* four-part analysis for commercial speech to further either proposed governmental interest. However, considering the current state of scientific research, the government could choose to implement other less restrictive means of regulating neuromarketing. These less restrictive regulations of neuromarketing-produced commercial speech may be upheld as constitutional now, as discussed below.

C. Government-Required Warnings on Neuromarketing as Compelled Commercial Speech

The government could attempt to regulate neuromarketing by requiring companies to include warning labels on any neuroscience-produced advertisements, explaining to consumers that these ad-

¹⁶⁰ Greater New Orleans, 527 U.S. at 188 (quoting [Bd. of Trs. of State Univ. of N.Y. v. Fox](#), 492 U.S. 469, 480 (1989)).

¹⁶¹ *Id.*

¹⁶² *Commercial Speech*, *supra* note 151, at 219-20. See also *44 Liquormart*, 517 U.S. at 500; *Cent. Hudson*, 447 U.S. at 566 n.9.

vertisements have been created with neuromarketing research. The government has more freedom to regulate commercial speech than other forms of protected speech, because commercial speech is not fully protected under the First Amendment.¹⁶³ The government may require advertisements to "appear in such a form, or include such additional information, warnings, and disclaimers, as are necessary to prevent its being deceptive."¹⁶⁴ Specifically, in *Zauderer v. Office of Disciplinary Counsel*, the Supreme Court held that government regulation may require advertisements to disclose any additional information that is "reasonably related to the [government's] interest in preventing deception."¹⁶⁵ The rationale behind allowing government-required disclosures in advertising is that, rather than preventing information from being disseminated to the public, the government is only requiring somewhat more information than would have been presented.¹⁶⁶ Although in some instances "compulsion to speak" has been held to "be as violative of the First Amendment as prohibitions on speech," in the commercial speech setting, the interests at stake are not the same.¹⁶⁷ The government is not attempting to "prescribe what shall be orthodox in politics, nationalism, religion, or other matters of opinion or force citizens to confess by word or act their faith therein."¹⁶⁸

Therefore, where advertisements are not necessarily inherently misleading, but only "potentially misleading," a complete ban may be inappropriate, but restrictions on those commercial messages may be imposed through the use of "disclaimers or explanation."¹⁶⁹ The Supreme Court has stated that the government may restrict commercial speech that exerts an "undue influence" on consumers.¹⁷⁰ Under this case law, even with the present scientific knowledge of only the potential for neuromarketing to be manipulative of consumers, this could still justify the government in requiring additional speech as a preventative measure. Neuromarketing researchers have already been able to discern some methods in which advertisements can work on subconscious levels and affect individuals in ways they do not even realize. It may be only a matter time before this research is further implemented in advertising and used in mass to affect the subconscious decisionmaking portions of the brains of consumers on a consistent basis.

A government regulation requiring warning messages has already been hypothesized by one neuroscience researcher when discussing the use of neuroscience in marketing.¹⁷¹ One such regulation might be that any advertisements produced with the [*639] use of neuroscience research have a clearly displayed warning (much like the surgeon general's warning placed on tobacco products)¹⁷² that informs consumers that neuroscience research was used to produce the advertisement or product and that it could be manipulative. For example, the warning could be required to

¹⁶³ Kuhne, *supra* note 126, at 612.

¹⁶⁴ [Va. State Bd. of Pharmacy v. Va. Citizens Consumer Council, Inc.](#), 425 U.S. 748, 771 n.24 (1976).

¹⁶⁵ [Zauderer v. Office of Disciplinary Counsel](#), 471 U.S. 626, 651 (1985).

¹⁶⁶ *Zauderer*, 471 U.S. at 650-51.

¹⁶⁷ *Id.* at 650 (citing [Wooley v. Maynard](#), 430 U.S. 705, 713-14 (1977); [Miami Herald Publ'g Co. v. Tornillo](#), 418 U.S. 241 (1974); [W. Va. State Bd. of Ed. v. Barnette](#), 319 U.S. 624 (1943)).

¹⁶⁸ *Id.* at 651 (quoting *Barnette*, 319 U.S. at 642).

¹⁶⁹ [In re R.M.J.](#), 455 U.S. 191, 203 (1982). See also Erin Bierbauer, Note, *Liquid Honesty: The First Amendment Right to Market the Health Benefits of Moderate Alcohol Consumption*, 74 N.Y.U. L. REV. 1057, 1078-79 (1999).

¹⁷⁰ 44 [Liquormart v. Rhode Island](#), 517 U.S. 484, 498 (1996) (quoting [Bates v. State Bar of Ariz.](#), 433 U.S. 350, 366 (1977)).

¹⁷¹ LYNCH & LAURSEN, *supra* note 56, at 72.

¹⁷² See 15 U.S.C. § 1333 (West, Westlaw through Pub. L. No. 112-89) (deeming it unlawful to manufacture, package, or import for sale within the United States, any cigarettes without one of the following labels on its package: "SURGEON GENERAL'S WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, And May Complicate Pregnancy; SURGEON GEN-

state, "[t]his advertisement has been produced using neuromarketing techniques and may manipulate you subconsciously." The value in this may be questioned because of enforcement issues¹⁷³ or because the average consumer has minimal knowledge about neuromarketing techniques, but it may give some companies pause about using neuromarketing and may grab the attention of some consumers.¹⁷⁴ Even if an individual consumer is unaware as to what neuromarketing techniques entail, including the specific warning about manipulation may alert him or her to the potential subconscious persuasive power of the advertisements. The government could also research potential counteractive measures and educate consumers through separate public service announcements [*640] about how to prevent the manipulative effects of neuromarketing advertisements. This would be a less restrictive and less paternalistic measure than a complete ban on neuromarketing and would allow consumers to decide whether to subject themselves to the potential manipulative effects of the advertisements.

Ultimately, "[b]ecause the extension of First Amendment protection to commercial speech is justified principally by the value to consumers of information such speech provides,"¹⁷⁵ and "disclosure requirements trench much more narrowly on an advertiser's interests than do flat prohibitions on speech, 'warning[s] or disclaimer[s] might be appropriately required . . . in order to dissipate the possibility of consumer confusion or deception.'" ¹⁷⁶ Because scientific research does not yet show that neuromarketing is currently being used to manipulate consumers, the Court may be hesitant to uphold a complete government ban of neuromarketing in the face of a constitutional challenge. However, even under the current state of science, the government could prove the potential for neuromarketing advertisements to be manipulative and that a required warning is directly related to the governmental interest of preventing an unfair bargaining process. Further, the regulation would not be overly excessive, because requiring the commercial speech to include more information is less extensive than banning the speech completely; especially taking into account that the rationale for granting First Amendment protection to commercial speech includes providing consumers with truthful information to help them make informed purchasing decisions.¹⁷⁷ The government could then regulate neuromarketing by requiring advertisements produced with neuromarketing strategies to include a warning, and given the current commercial

ERAL'S WARNING: Quitting Smoking Now Greatly Reduces Serious Risks to Your Health; SURGEON GENERAL'S WARNING: Smoking By Pregnant Women May Result in Fetal Injury, Premature Birth, And Low Birth Weight; SURGEON GENERAL'S WARNING: Cigarette Smoke Contains Carbon Monoxide"). See also Rubin, 514 U.S. at 492, 492 n.1 (Stevens, J., concurring) (stating that in the commercial speech context, the government "often requires affirmative disclosures that the speaker might not make voluntarily," and citing the Surgeon General's Warning on tobacco labels as an example).

¹⁷³ As evidenced by the following studies, the Federal Trade Commission ("FTC") has been unable to effectively police all advertisements, and as a result, many advertisements make misleading or untruthful claims in violation of the law. One study, conducted in 1993, found that not one of the 157 commercial disclosures they studied met all of the required FTC standards. See Marie Grubbs Hoy & Michael J. Stankey, *Structural Characteristics of Televised Advertising Disclosures: A Comparison with the FTC Clear and Conspicuous Standard*, 22 J. ADVERTISING 47, 55 (1993). Another study, focusing on pharmaceutical advertisements published in professional journals, determined that ninety-two percent of the advertisements they reviewed were in violation of FDA standards in at least one of twenty-eight categories. See Jon D. Hanson & Douglas A. Kysar, *Taking Behaviorism Seriously: Some Evidence of Market Manipulation*, 112 HARV. L. REV. 1420, 1458 (1999). Further, "a 1990 study found that television stations' advertising review and acceptance process 'varied widely' from station to station, and that twenty-one of 426 surveyed stations had not requested substantiation for any commercial in the past six months." Haan, *supra* note 140, at 1295 n.70 (citing Herbert J. Rotfeld et al., *Self-Regulation and Television Advertising*, 19 J. ADVERTISING 18, 21-23 (1990)).

¹⁷⁴ The backlash to claims about the effectiveness of subliminal messaging in affecting consumer decision making may be indicative of how consumers might react upon seeing warnings about the use of neuroscience to create advertisements that appeal to the subconscious. See LYNCH & LAURSEN, *supra* note 56, at 51.

¹⁷⁵ [Zauderer v. Office of Disciplinary Counsel](#), 471 U.S. 626, 651 (1985) (citing [Va. State Bd. of Pharmacy v. Va. Citizens Consumer Council, Inc.](#), 425 U.S. 748, 763-64 (1976)).

¹⁷⁶ Zauderer, 471 U.S. at 651 (quoting [In re R.M.J.](#), 455 U.S. 191, 203 (1982)).

¹⁷⁷ See [Va. State Bd. of Pharmacy](#), 325 U.S. at 763-64.

speech doctrine and precedents, it is likely that it would be upheld by the Court.

D. Revival of the Greater / Lesser Principle in the Neuromarketing Context

Last, another possible approach the government could take in regulating neuromarketing may be to regulate only the use of neuromarketing in advertisements for harmful products, or those products in opposition to public health and safety. For such a regulation to be sustained, this would require the courts to revive the “greater-power-includes-the-lesser-power” rationale originally put forth in *Posadas*,¹⁷⁸ but later overturned in *44 Liquormart*.¹⁷⁹ The Supreme Court explained the greater-power-includes-the-lesser-power rationale in *Posadas* by asserting that “because the government could have enacted a wholesale prohibition of the underlying conduct,” it is then permissible for the government to take the lesser step of reducing demand by restricting advertising.¹⁸⁰ It appears that the original underlying assumption of the greater-power-includes-the-lesser-power principle is that commercial speech does, in fact, directly relate to consumer behavior. This is evidenced by the Court’s decision in *Posadas* that the regulation restricting casino gambling passed the third and fourth prongs of the *Central Hudson* analysis.¹⁸¹ However, in *44 Liquormart*, when the Court overturned the greater-power-includes-the-lesser-power principle, it rejected the notion that advertising affects consumer behavior.¹⁸² Admittedly, it would be challenging to convince the Court to revive the greater-power-includes-the-lesser-power principle, but the Court might be persuaded if scientific research about the effectiveness of neuromarketing-produced advertising were presented to it.¹⁸³

Some commentators argue that the Court was correct in overturning the greater-power-includes-the-lesser-power rationale of *Posadas*, because the Constitution affords greater protection to speech under the First Amendment than the Due Process clause provides to the sale of products.

¹⁷⁸ [478 U.S. 328, 345-46 \(1986\).](#)

¹⁷⁹ 517 U.S. 498, 511-12 (1996). Some examples of harmful products or harmful activity include tobacco, alcohol, and gambling. See David C. Wladeck & John Cary Sims, *Why the Supreme Court Will Uphold Strict Controls on Tobacco Advertising*, [22 S. ILL. U. L.J. 651, 656-57, 660 \(1998\).](#)

¹⁸⁰ *Posadas*, 478 U.S. at 346.

¹⁸¹ *Id.* at 341-42.

¹⁸² See Haan, *supra* note 140, at 1311.

¹⁸³ Further, circuit court interpretations have continued to vary over when a paternalistic approach by states should be upheld to allow regulation of harmful products under the commercial speech doctrine. See Shannon M. Hinegardner, Note, *Abrogating the Supreme Court’s De Facto Rational Basis Standard for Commercial Speech: A Survey and Proposed Revision of the Third Central Hudson Prong*, [43 NEW ENG. L. REV. 523, 553 \(2009\).](#) In recent decisions, the Fourth Circuit and Third Circuit have split on the proper application of *Central Hudson* when reviewing the constitutionality of government regulations of alcohol advertisements in college student publications. Michelle Silva Fernandes, Note, *Party Foul: The Fourth Circuit’s Improper Application of the Commercial Speech Test in Educational Media Co. at Virginia Tech, Inc. v. Swecker*, [80 FORDHAM L. REV. 1325, 1349 \(2011\).](#) In *Educational Media Company at Virginia Tech, Inc. v. Swecker*, the United States Court of Appeals for the Fourth Circuit upheld a ban on alcoholic advertisements in college student publications under *Central Hudson*, finding that the “link between [the regulation] and decreasing demand for alcohol by college students to be amply supported by the record.” [602 F.3d 583, 590 \(4th Cir. 2010\).](#) As the court of appeals explained, “college student publications primarily target college students and play an inimitable role on campus.” *Educational Media Co.*, 602 F.3d at 590. Yet, in *Pitt News v. Pappert*, the United States Court of Appeals for the Third Circuit, applying *Central Hudson*, struck down a regulation on advertisements of alcoholic beverages in publications of educational institutions. [379 F.3d 96, 101 \(3d Cir. 2004\).](#) The court conceded there was no dispute that “alcoholic beverage advertising in general tends to encourage consumption,” *Pitt News*, 379 F.3d at 107, however, it found no evidence in the record that targeting advertisements in the narrower sector of educational publications would decrease demand for alcohol among underage consumers, given that they would still be bombarded with television and print advertisements for alcohol elsewhere. *Id.* Although these decisions differ in their end result, they appear to show that were courts presented with convincing evidence that advertisements indeed affect consumer behavior, commercial speech regulations of advertisements that would increase harmful conduct would likely be upheld.

¹⁸⁴ It is argued that this choice reflects “the special value placed on the human capacities for thought and verbal communication” and that “[b]ecause thought is so highly valued as a uniquely human activity, interferences with the operations of the mind are deemed to constitute greater impairments of human dignity than are restrictions on most forms of conduct.”¹⁸⁵ First, this rationale actually supports the argument that the greater-power-includes-the-lesser-power should apply to governmental regulation of neuromarketing advertisements for harmful products, because neuromarketing seeks to manipulate the subconscious decisions of consumers. This manipulation of consumers’ subconscious is exactly the “interferences with the operations of the mind” that are “deemed to constitute greater impairments of human dignity than . . . restrictions on most forms of conduct.”¹⁸⁶

Second, in comparing the First Amendment and the Due Process clause, this argument does not take into account the distinction between First Amendment protection in general and the limited protection granted to commercial speech under the First Amendment. A complete ban on the sale of products should not be considered less extensive than government regulation of the *commercial* speech advertising those products. While commercial speech has been granted limited protection under the First Amendment, the rationales for that protection are weak, and commercial speech has never been placed on the same level with speech fully protected under the First Amendment.¹⁸⁷ Therefore, this argument falters, in that while fully protected speech under the First Amendment *may* be elevated to a higher degree than Due Process protection for the sale of products, it does not necessarily follow that the level of protection for commercial speech is higher than Due Process protections for the sale of products.

In the realm of neuromarketing-produced commercial speech, the rationales for abandoning the greater-power-includes-the-lesser-power principle do not hold up. Under this rationale, the government could constitutionally implement some form of regulation of the use of neuromarketing for harmful products or those which the government could ban the sale of completely for public health or safety concerns. Although such a regulation would be supported by the underlying principles of the commercial speech doctrine and the greater-power-includes-the-lesser-power rationale, under the current case law of the commercial speech doctrine, it appears well settled that the government cannot regulate commercial speech merely because it could ban the sale of the harmful products being advertised.¹⁸⁸ Therefore, such a regulation should be upheld in theory, but stands on shaky grounds with the current commercial speech case law.

V. CONCLUSION

If the predictions of neuromarketing researchers in fact occur, and the public becomes aware,

¹⁸⁴ See, e.g., Martin H. Redish, *Tobacco Advertising and the First Amendment*, [81 IOWA L. REV. 589, 599 \(1996\)](#). Justice Stevens drew this same conclusion in his opinion in *44 Liquormart v. Rhode Island*, stating that “it [is] quite clear that banning speech may sometimes prove far more intrusive than banning conduct.” [517 U.S. 484, 511 \(1996\)](#).

¹⁸⁵ Redish, *supra* note 184, at 601.

¹⁸⁶ *Id.*

¹⁸⁷ Even some of the strongest advocates for absolute freedom of speech, such as Justice Hugo Black, the scholar Thomas Emerson, or the political theorist John Stuart Mill, have each consistently rejected the notion that commercial speech should have any First Amendment Protection. C. Edwin Baker, *Paternalism, Politics, and Citizen Freedom: the Commercial Speech Quandary in Nike*, [54 CASE W. RES. L. REV. 1161, 1162 \(2004\)](#) (“Neither Mill nor Black nor Emerson saw freedom of speech as about, or as including, a business’s speech promoting its sales and profits.”).

¹⁸⁸ Further, determining what products rise to the level of “harmful,” such that the government can regulate commercial speech dealing with those products could become an arbitrary process, if one tries to keep the class of products narrow, or could threaten to engulf the entire commercial speech doctrine, if too many products were included. Therefore, it might be more difficult now to persuade the Court to revive the greater-power-includes-the-lesser-power-principle because of the difficult task of determining where to draw the line for “harmful” products.

there will likely be a demand for the government to regulate neuromarketing, much like there was with subliminal messaging. If scientific research becomes available to the public showing that neuromarketing could potentially manipulate consumer behavior, it will raise the public's already heightened suspicion of advertisers. The notion that companies [*644] could use brain imaging to make their marketing strategies so effective that they bypass all individual rational thought and only appeal to the subconscious, decision-making older brain, is likely unacceptable to most people. It is probable then that the government will seek to regulate neuromarketing in some form, and the government may be able to do so constitutionally.

Under the current state of available scientific knowledge as to the capability and use of neuroscience in advertising, the Supreme Court may not be inclined to uphold a complete ban of neuromarketing as constitutional under the present commercial speech doctrine. However, the government may already be able to constitutionally require disclaimers in advertisements that alert consumers when advertisements are created with neuromarketing. The government could also attempt to persuade the Court to revive the greater-power-includes-the-lesser-power rationale in this context, in order to allow the government to regulate the use of neuromarketing with advertisements of harmful products.

If neuromarketing research establishes in the future that neuromarketing is manipulative and can exert an undue influence on consumers, this would create an unfair bargaining process. Then, the Court would likely be persuaded to conclude that neuromarketing would fall outside the realm of protected commercial speech, and therefore, be subject to any government regulation, including a complete prohibition. Ultimately, the government could constitutionally adopt some form of regulation of neuromarketing now, and the government may attempt to regulate it in the near future, given the accelerated rate of discovery in the neuromarketing field.